Claims

1. An isolated polypeptide comprising an amino acid sequence selected from the group consisting of at least one of

SEQ ID NO.: 2, SEQ ID NO.: 4 and SEQ ID NO.: 6

for use as a medicament.

2. An isolated polypeptide according to claim 1, wherein said amino acid sequence has at least 80% sequence identity to SEQ ID NO.: 2, SEQ IN NO.: 4 and SEQ ID NO.: 6.

3. An isolated polypeptide according to claim 1 or 2, wherein said amino acid sequence is a sub-sequence of with a minimum length of 10 amino acids.

4. A polypeptide according to claim 1, wherein said polypeptide comprises the amino acid sequence shown in SEQ ID NO:2.

5. A polypeptide according to claim 4, wherein said polypeptide consists of the amino acid sequence shown in SEQ ID NO:2.

6. A polypeptide according to claim 1, wherein said polypeptide comprises the amino acid sequence shown in SEQ ID NO:4.

7. A polypeptide according to claim 6, wherein said polypeptide consists of the amino acid sequence shown in SEQ ID NO:4.

8. A polypeptide according to claim 1, wherein said polypeptide comprises the amino acid sequence shown in SEQ ID NO:6.

9. A polypeptide according to claim 8, wherein said polypeptide consists of the amino acid sequence shown in SEQ ID NO:6.

10. A polypeptide according to claim 1, wherein said amino acid sequence has at least 80% sequence identity to SEQ ID NO:2.

11. A polypeptide according to claim 1, wherein said amino acid sequence has at least 80% sequence identity to SEQ ID NO:4.

12. A polypeptide according to claim 1, wherein said amino acid sequence has at least 80% sequence identity to SEQ ID NO:6.

13. An polypeptide to claim 1-12, wherein said amino acid is consistently up-regulated after antibody selection-induced change from VSA_{UM} to VSA_{SM} expression.

14. An polypeptide according to claim 1-13, wherein said amino acid sequence is capable of mediating cyto-adhesion of intact erythrocyte infected by a parasite to human endothelial cells, but not to the CD36 receptor.

15. An isolated nucleic acid comprising a nucleotide sequence selected from the group consisting of at least one of

a) SEQ ID NO.: 1, SEQ ID NO.: 3 and SEQ ID NO.: 5

for use as a medicament.

16. A nucleic acid according to claim 15, wherein said nucleotide sequence has at least 80% sequence identity to SEQ ID NO.: 1, SEQ ID NO.: 3 or SEQ ID NO.: 5.

17. A nucleic acid according to claim 15-16, wherein said nucleotide sequence is a sub-sequence of with a minimum length of 30 nucleotides.

18. A nucleic acid according to claim 15, wherein said nucleic acid comprises the nucleotide sequence shown in SEQ ID NO:1.

19. A nucleic acid according to claim 18, wherein said nucleic acid consists of the nucleotide sequence shown in SEQ ID NO:1.

20. A nucleic acid according to claim 15, wherein said nucleic acid comprises the nucleotide sequence shown in SEQ ID NO:3.

21. A nucleic acid according to claim 20, wherein said nucleic acid consists of the nucleotide sequence shown in SEQ ID NO:3.

22. A nucleic acid according to claim 15, wherein said nucleic acid comprises the nucleotide sequence shown in SEQ ID NO:5.

23. A nucleic acid according to claim 22, wherein said nucleic acid consists of the nucleotide sequence shown in SEQ ID NO:5.

24. A nucleic acid according to claim 15, wherein said nucleotide sequence has at least 80% sequence identity to SEQ ID NO:1.

25. A nucleic acid according to claim 15, wherein said nucleotide sequence has at least 80% sequence identity to SEQ ID NO:3.

26. A nucleic acid according to claim 15, wherein said nucleotide sequence has at least 80% sequence identity to SEQ ID NO:5.

27. A nucleic acid sequence according to claim 15-26, wherein said sequence is consistently upregulated after antibody selection-induced change from VSA_{UM} to VSA_{SM} expression.

28. A nucleic acid according to claim 15-17, wherein said nucleic acid sequence encodes a polypeptide which is capable of mediating cyto-adhesion of intact erythrocyte infected by a parasite to human endothelial cells, but not the CD36 receptor.

29. A recombinant vector comprising the nucleic acid defined in any of claims 15-28 operably linked to one or more control sequences for use as a medicament

30. A composition comprising a polypeptide according to any of claims 1-14 or a nucleic acid according to any of claims 15-28 and a pharmaceutically acceptable diluent, carrier or adjuvant.

31. A composition according to claim 30, wherein said composition is an immunogenic composition.

32. A composition according to claim 31, wherein said composition induces an IgG/IgM antibody response.

33. An isolated antibody or isolated antiserum induced in response to one or more polypeptides as defined in any of claims 1-14 and/or to one or more nucleic acids as defined in any of claims 15-28.

34. An antibody according to claim 33, wherein said antibody is capable of binding to a molecule expressed on the surface of an intact erythrocyte infected by a parasite causing malaria.

35. An antibody according to claim 33, wherein said antibody is capable of recognising parasites selected *in vitro* for expression of VSA_{SM}.

36. An antibody according to claim 33, wherein said antibody is capable of binding to a molecule expressed on the surface of an intact erythrocyte infected by a parasite capable of mediating cyto-adhesion of intact erythrocyte infected by a parasite to human endothelial cells, but not the CD36 receptor.

36. A vaccine comprising at least one nucleic acid according to any of claims 15-28 or at least one vector according to claim 29, the vaccine effecting *in vivo* expression of at least one antigen by a subject, to whom the vaccine has been administered, the amount of expressed antigen being effective to confer substantially increased resistance to malaria caused by *Plasmodium falciparum*.

37. Use of a polypeptide according to any of claims 1-14 for the manufacture of a composition to be administered in order to prophylactically or therapeutically reduce the incidence, prevalence or severity of malaria in a subject.

38. Use of a polypeptide according to any of claims 1-14 for the manufacture of a vaccine for malaria prophylaxis.

39. Use of a polypeptide according to any of claims 1-12 for the manufacture of a composition for vaccination against malaria.

40. Use of a nucleic acid according to any of claims 15-28 for the manufacture of an composition to be administered in order to prophylactically or therapeutically reduce the incidence, prevalence or severity of malaria in a subject.

41. Use of a nucleic acid according to any of claims 1-28 for the manufacture of a vaccine for malaria prophylaxis.

42. Use of a nucleic acid according to any of claims 15-28 for the manufacture of a composition for vaccination against malaria.

43. Use of a recombinant vector according to claim 29 for the manufacture of a composition to be administered in order to prophylactically or therapeutically reduce the incidence, prevalence or severity of malaria in a subject.

44. Use of a recombinant vector according to claim 29 for the manufacture of a vaccine for prophylactic treatment of severe malaria.

45. Use of a recombinant vector according to claim 29 for the manufacture of a composition for vaccination against severe malaria.

46. Use according to any of claims 37-45, wherein said malaria is caused by *Plasmodium falciparum.*

47. A method for prophylactically or therapeutically reduce the incidence, prevalence or severity of malaria in an subject said method comprising administering to said subject an effective amount of a polypeptide according to any of claims 1-14, a nucleic acid according to any of claims 15-28 or a recombinant vector according to claim 29.

48. A method for the prophylactic treatment of severe malaria in an subject, said method comprising administering to said subject an effective amount of a polypeptide according to any of claims 1-14, a nucleic acid according to any of claims 15-28 or a recombinant vector according to claim 29.

49. A vaccination method against severe malaria in an subject, said vaccination method comprising administering to said subject an effective amount of a polypeptide according to any of claims 1-14, a nucleic acid according to any of claims 15-28 or a recombinant vector according to claim 29.

50. A vaccine comprising any of the polypeptides according to any of claims 1-14, the nucleic acids according to any of claims 15-28 or the recombinant vector according to claim 29, said vaccine characterised in that it induces an immune response, wherein said immune response specifically recognises a molecule expressed on the surface of an intact erythrocyte infected by a parasites.

51. A vaccine comprising one or more B-cell and/or T-cell epitopes originating from any of the polypeptides according to any of claims 1-14, the nucleic acids according to any of claims 15-28 or the recombinant vector according to claim 29, said vaccine characterised in that it induces an immune response, wherein said immune response specifically

recognises a molecule expressed on the surface of an intact erythrocyte infected by a parasites.

52. A DNA vaccine, which results in the expression of a polypeptide comprising one or more B-cell and/or T cell epitopes from any of the polypeptide sequences according to claim 1-14, wherein said vaccine is capable of inducing an immune response, wherein said immune response specifically recognises a molecule expressed on the surface of an intact erythrocyte infected by parasites.

53. A DNA vaccine comprising at least one nucleic acid sequences according 15-28, wherein said vaccine is capable of inducing an immune response, wherein said immune response specifically recognises a molecule expressed on the surface of an intact erythrocyte infected by parasites.

54. An *in vitro* diagnostic method, said method comprising contacting a sample with a polypeptide according to any of claims 1-14 under conditions allowing an *in vitro* immunological reaction to occur between said polypeptide and the antibodies possibly present in said sample, and *in vitro* detect the antigen-antibody complexes possibly formed.

55. An *in vitro* diagnostic method according to claim 54, wherein a disease-state profile for a tested subject is generated by determining the concentration or expression level in a sample of sequences as defined in any of claims 1-14 and/or 15-28.

56. An *in vitro* diagnostic kit comprising

a) a sequence as defined in any of claims 1-14 and/or 15-28
b) reagents for preparing a suitable medium for carrying out an immunological reaction between an antibody present in a sample of body fluid or tissue and said sequence; and
c) reagents allowing the detection of the antigen-antibody complexes formed, wherein said reagents may bear a radioactive or non-radioactive label.

57. A method for generating a vaccine against severe malaria comprising

a) injecting a sequence according to any of claims 1-14 in a subject
b) enabling said subject to generate antibodies specifically recognising any of the polypeptide sequences according to claim 1-14
c) purify said antibodies
d) selecting antibodies having cross-reactivityto parasites causing severe malaria

e) selecting antibodies having the ability to inhibit adhesion to endothelial cells.

58. A method for testing an inhibitor-molecule capable of inhibiting binding of any of the polypeptides according to claim 1-14 to a receptor expressed on endothelia cells comprising

a) *in vitro* cultures of endothelial cells

b) add potential inhibiting-molecule

c) add RBC infected with parasites, said iRBC expressing any of said polypeptide sequences on their surface of the RBC

d) measure the binding of the iRCB with said endothelia cells by microscopy or other means of quantifying binding as for instance liquid scintillation spectrometry.